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**CCGPS**

**Curriculum Map**

**Mathematics**

Year 2



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Common Core Georgia Performance Standards

High School Mathematics

**CCGPS Advanced Algebra Year 2 – At a Glance**

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| Common Core Georgia Performance Standards: Curriculum Map | | | | | | | |
| 1st Semester | | | | 2nd Semester | | | |
|  |  |  |  | |  |  | |
| Unit 1  ***(4 – 5 weeks)*** | Unit 2  ***(5 – 6 weeks)*** | Unit 3  ***(5 – 6 weeks)*** | Unit 4  ***(3 – 4 weeks)*** | | Unit 5  ***(3 – 4 weeks)*** | Unit 6  ***(7 – 8 weeks)*** | |
| **Inferences and Conclusions from Data Part B** | **Exponential Functions** | **Logarithmic Functions** | **Trigonometric Functions and the Unit Circle** | | **Trigonometric Functions and Their Graphs** | **Mathematical Modeling Part B** | |
| **MCC9-12.S.ID.2**  **MCC9-12.S.ID.4**  **MCC9-12.S.IC.1**  **MCC9-12.S.IC.2**  **MCC9-12.S.IC.3**  **MCC9-12.S.IC.4**  **MCC9-12.S.IC.5**  **MCC9-12.S.IC.6** | **MCC9-12.A.SSE.3c**  **MCC9-12.F.IF.7e**  **MCC9-12.F.IF.8b**  **MCC9-12.F.LE.4** | **MCC9-12.A.SSE.3c**  **MCC9-12.F.IF.7e**  **MCC9-12.F.IF.8b**  **MCC9-12.F.BF. 4a**  **MCC9-12.F.LE.4** | **MCC9-12.F.TF.1**  **MCC9-12.F.TF.2**  **MCC9-12.F.TF.8** | | **MCC9-12.F.IF.7e**  **MCC9-12.F.TF.1**  **MCC9-12.F.TF.2**  **MCC9-12.F.TF.5**  **MCC9-12.F.TF.8** | **MCC9-12.F.IF.4**  **MCC9-12.F.IF.5**  **MCC9-12.F.IF.7e** | **MCC9-12.F.IF.8b**  **MCC9-12.F.IF.9**  **MCC9-12.F.BF.1a,b,**  **MCC9-12.F.BF.3**  **MCC9-12.F.BF.4a** |
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| These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units.  All units will include the Mathematical Practices and indicate skills to maintain.  Plus standards (+) associated with Advanced Algebra are not reflected in this curriculum map, but could be taught to students as appropriate. | | | | | | | |

**NOTE:** Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.

**Grade 9-12 Key:**

**Number and Quantity Strand:** RN = The Real Number System, Q = Quantities, CN = Complex Number System, VM = Vector and Matrix Quantities

**Algebra Strand**: SSE = Seeing Structure in Expressions, APR = Arithmetic with Polynomial and Rational Expressions, CED = Creating Equations, REI = Reasoning with Equations and Inequalities

**Functions Strand**: IF = Interpreting Functions, LE = Linear and Exponential Models, BF = Building Functions, TF = Trigonometric Functions

**Geometry Strand:** CO = Congruence, SRT = Similarity, Right Triangles, and Trigonometry, C = Circles, GPE = Expressing Geometric Properties with Equations, GMD = Geometric Measurement and Dimension,

MG = Modeling with Geometry

**Statistics and Probability Strand:** ID = Interpreting Categorical and Quantitative Data, IC = Making Inferences and Justifying Conclusions, CP = Conditional Probability and the Rules of Probability, MD = Using Probability to Make Decisions

Specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

**Common Core Georgia Performance Standards**

**CCGPS Advanced Algebra Year 2 – 1st Semester**

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| Common Core Georgia Performance Standards: Curriculum Map | | | |
| **Standards for Mathematical Practice** | | | |
| **1** Make sense of problems and persevere in solving them.  **2** Reason abstractly and quantitatively.  **3** Construct viable arguments and critique the reasoning of others.  **4** Model with mathematics. | | **5** Use appropriate tools strategically.  **6** Attend to precision.  **7** Look for and make use of structure.  **8** Look for and express regularity in repeated reasoning. | |
| **1st Semester** | | | |
|  |  | |  |
| Unit 1 | Unit 2 | | Unit 3 |
| **Inferences and Conclusions from Data Part B** | **Exponential Functions** | | **Logarithmic Functions** |
| **Summarize, represent, and interpret data on a single count or measurement variable**  **MCC9-12.S.ID.2** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.★  **MCC9-12.S.ID.4** Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.★  **Understand and evaluate random processes underlying statistical experiments**  **MCC9-12.S.IC.1** Understand statistics as a process for making inferences about population parameters based on a random sample from that population.★  **MCC9-12.S.IC.2** Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.  **Make inferences and justify conclusions from sample surveys, experiments, and observational studies**  **MCC9-12.S.IC.3** Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.★  **MCC9-12.S.IC.4** Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.★  **MCC9-12.S.IC.5** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.★  **MCC9-12.S.IC.6** Evaluate reports based on data.★ | **Write expressions in equivalent forms to solve problems**  **MCC9-12.A.SSE.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ *(Limit to exponential and logarithmic functions.)*  **MCC9-12.A.SSE.3c** Use the properties of exponents to transform expressions for exponential functions.  **Analyze functions using different representations**  **MCC9-12.F.IF.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ *(Limit to exponential and logarithmic functions.)*  **MCC9-12.F.IF.7e** Graph exponential and logarithmic functions, showing intercepts and end behavior, ~~and trigonometric functions, showing period, midline, and amplitude.~~★  **MCC9-12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. *(Limit to exponential and logarithmic functions.)*  **MCC9-12.F.IF.8b** Use the properties of exponents to interpret expressions for exponential functions. *(Limit to exponential and logarithmic functions.)*  **Construct and compare linear, quadratic, and exponential models and solve problems**  **MCC9-12.F.LE.4** For exponential models, express as a logarithm the solution to ab(ct) = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.★ | | **Write expressions in equivalent forms to solve problems**  **MCC9-12.A.SSE.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ *(Limit to exponential and logarithmic functions.)*  **MCC9-12.A.SSE.3c** Use the properties of exponents to transform expressions for exponential functions.  **Analyze functions using different representations**  **MCC9-12.F.IF.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ *(Limit to exponential and logarithmic functions.)*  **MCC9-12.F.IF.7e** Graph exponential and logarithmic functions, showing intercepts and end behavior, ~~and trigonometric functions, showing period, midline, and amplitude.~~★  **MCC9-12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. *(Limit to exponential and logarithmic functions.)*  **MCC9-12.F.IF.8b** Use the properties of exponents to interpret expressions for exponential functions. *(Limit to exponential and logarithmic functions.)*  **Build new functions from existing functions**  **MCC9-12.F.BF.4** Find inverse functions.  **MCC9-12.F.BF.4a** Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse.  **Construct and compare linear, quadratic, and exponential models and solve problems**  **MCC9-12.F.LE.4** For exponential models, express as a logarithm the solution to ab(ct) = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.★ |
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**Common Core Georgia Performance Standards**

**CCGPS Advanced Algebra Year 2 – 2nd Semester**

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| Common Core Georgia Performance Standards: Curriculum Map | | | |
| **Standards for Mathematical Practice** | | | |
| **1** Make sense of problems and persevere in solving them.  **2** Reason abstractly and quantitatively.  **3** Construct viable arguments and critique the reasoning of others.  **4** Model with mathematics. | | **5** Use appropriate tools strategically.  **6** Attend to precision.  **7** Look for and make use of structure.  **8** Look for and express regularity in repeated reasoning. | |
| **2nd Semester** | | | |
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| Unit 4 | Unit 5 | | Unit 6 |
| **Trigonometric Functions and the Unit Circle** | **Trigonometric Functions and Their Graphs** | | **Mathematical Modeling Part B** |
| **Extend the domain of trigonometric functions using the unit circle**  **MCC9-12.F.TF.1** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.  **MCC9-12.F.TF.2** Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.  **Prove and apply trigonometric identities**  **MCC9-12.F.TF.8** Prove the Pythagorean identity (sin A)2 + (cos A)2 = 1 and use it to find sin A, cos A, or tan A, given sin A, cos A, or tan A, and the quadrant of the angle. | **Analyze functions using different representations**  **MCC9-12.F.IF.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ *(Limit to trigonometric functions.)*  **MCC9-12.F.IF.7e** Graph ~~exponential and logarithmic functions, showing intercepts and end behavior~~, and trigonometric functions, showing period, midline, and amplitude.★  **Extend the domain of trigonometric functions using the unit circle**  **MCC9-12.F.TF.1** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.  **MCC9-12.F.TF.2** Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.  **Model periodic phenomena with trigonometric functions**  **MCC9-12.F.TF.5** Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.★  **Prove and apply trigonometric identities**  **MCC9-12.F.TF.8** Prove the Pythagorean identity (sin A)2 + (cos A)2 = 1 and use it to find sin A, cos A, or tan A, given sin A, cos A, or tan A, and the quadrant of the angle. | | **Interpret functions that arise in applications in terms of the context**  **MCC9-12.F.IF.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★  **MCC9-12.F.IF.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.★  **Analyze functions using different representations**  **MCC9-12.F.IF.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★  **MCC9-12.F.IF.7e** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.★  **MCC9-12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.  **MCC9-12.F.IF.8b** Use the properties of exponents to interpret expressions for exponential functions.  **MCC9-12.F.IF.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).  **Build a function that models a relationship between two quantities**  **MCC9-12.F.BF.1** Write a function that describes a relationship between two quantities.★  **MCC9-12.F.BF.1a** Determine an explicit expression, a recursive process, or steps for calculation from a context.  **MCC9-12.F.BF.1b** Combine standard function types using arithmetic operations.  **Build new functions from existing functions**  **MCC9-12.F.BF.3** Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.  **MCC9-12.F.BF.4** Find inverse functions.  **MCC9-12.F.BF.4a** Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. |
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